

**AN ASSESSMENT
OF SHORELINE CHANGE OPTIONS
IN SOUTH CAROLINA:
A PROGRESS REPORT**

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Project Components

- Phase 1: An overview of current and emerging shoreline retreat strategies including a comparative state assessment,
- Phase 2: An assessment of the perceived effectiveness of the South Carolina Beachfront Management Program, and
- Phase 3: An examination of the feasibility of policy options and recommended program changes.

Completed Research

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- Literature review of historical state shoreline management options and review of state statutes and program plans.
- Survey of state coastal managers (29 completed).
- Conducting follow-up surveys of innovative states.
- Compiled information regarding shoreline change and development patterns.



Kiawah Island <http://www.cornerstonesri.com/island.jpg>



Phase 1

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Methodology

Triangulation:

▣ Background

- Literature Review and primary source gathering
- Legal research and statutory analysis for coastal states

▣ Survey Research

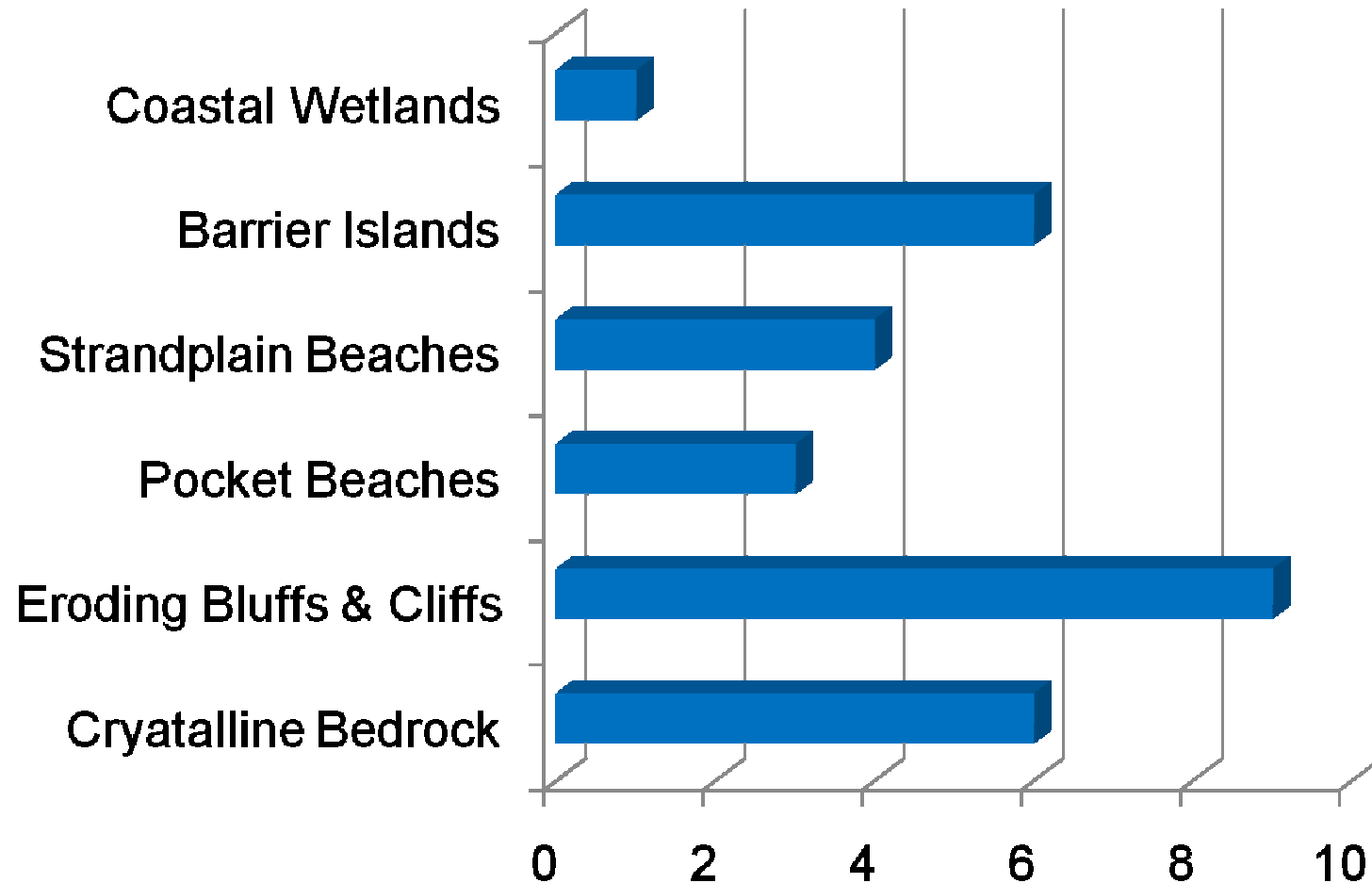
- State Coastal Manager Surveys
- Follow-up with Coastal Managers in Innovative States

▣ Public Input

- Focus groups in the state of South Carolina
- Comparing the statutory setbacks and actual effects on the shoreline

Predominant Shoreline Type

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Development Patterns

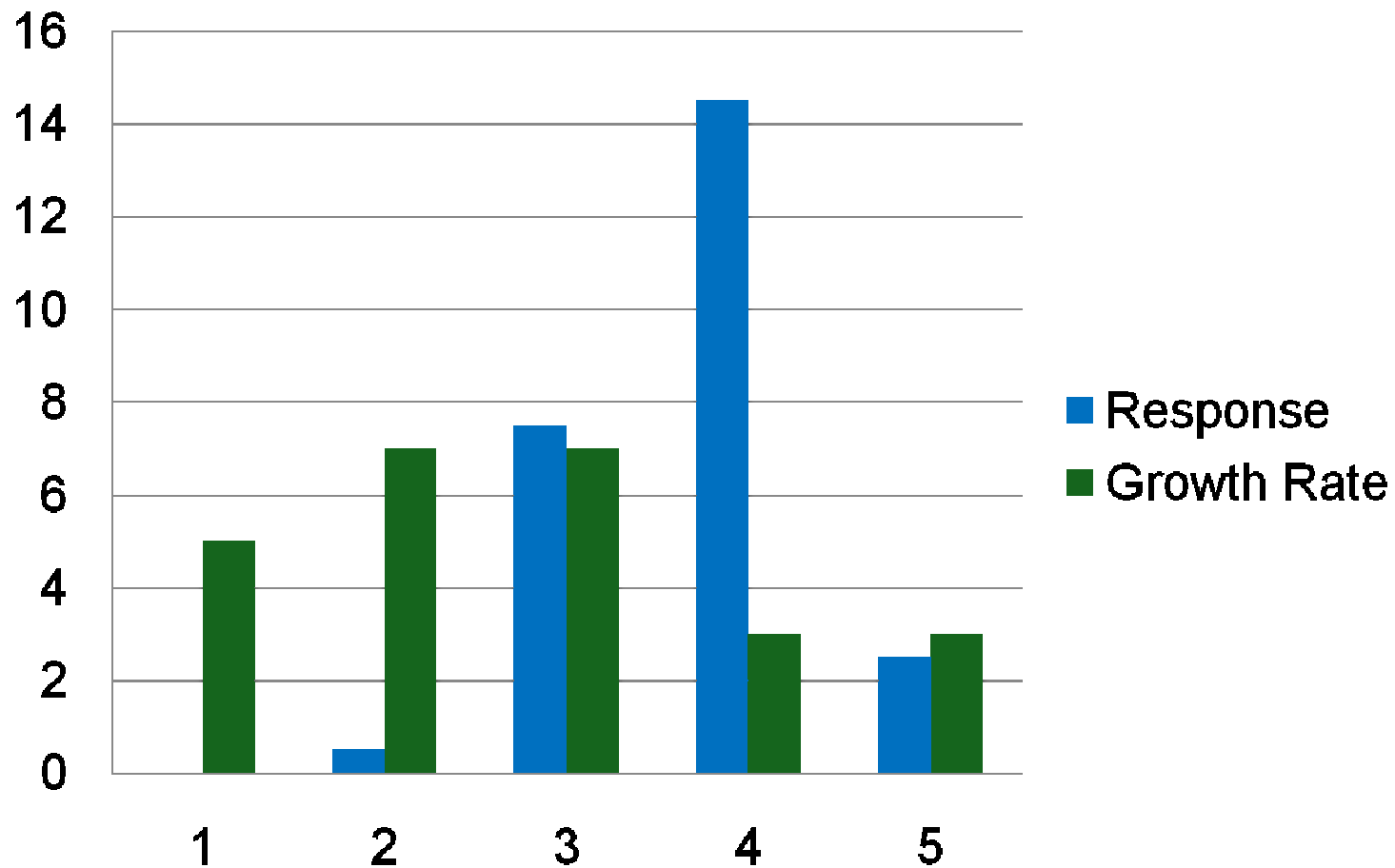
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State	Development/Redevelopment Pressure Rating	Percent Change of Persons per Mile 2000-2006
Lousiana	4	-6.30%
Mississippi	4	-2.38%
Illinois	3	-1.64%
Pennsylvania	3	0.00%
Ohio	4	0.57%
Rhode Island	5	1.84%
Connecticut	4	2.91%
Michigan	3	3.06%
New Jersey	5	3.63%
Alabama	4	3.66%
Maine	4	3.99%
Indiana	3	4.23%
Wisconsin	3	5.35%
Hawaii	4.5	6.10%
South Carolina	4	6.84%
New Hampshire	3	6.91%
California	4	7.19%
Maryland	4	7.25%
North Carolina	4	7.33%
Delaware	2.5	8.92%
Oregon	4	10.49%
Texas	4	10.90%
Georgia	3	12.79%
Florida	4	13.29%
Minnesota	4	14.99%

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Development Patterns

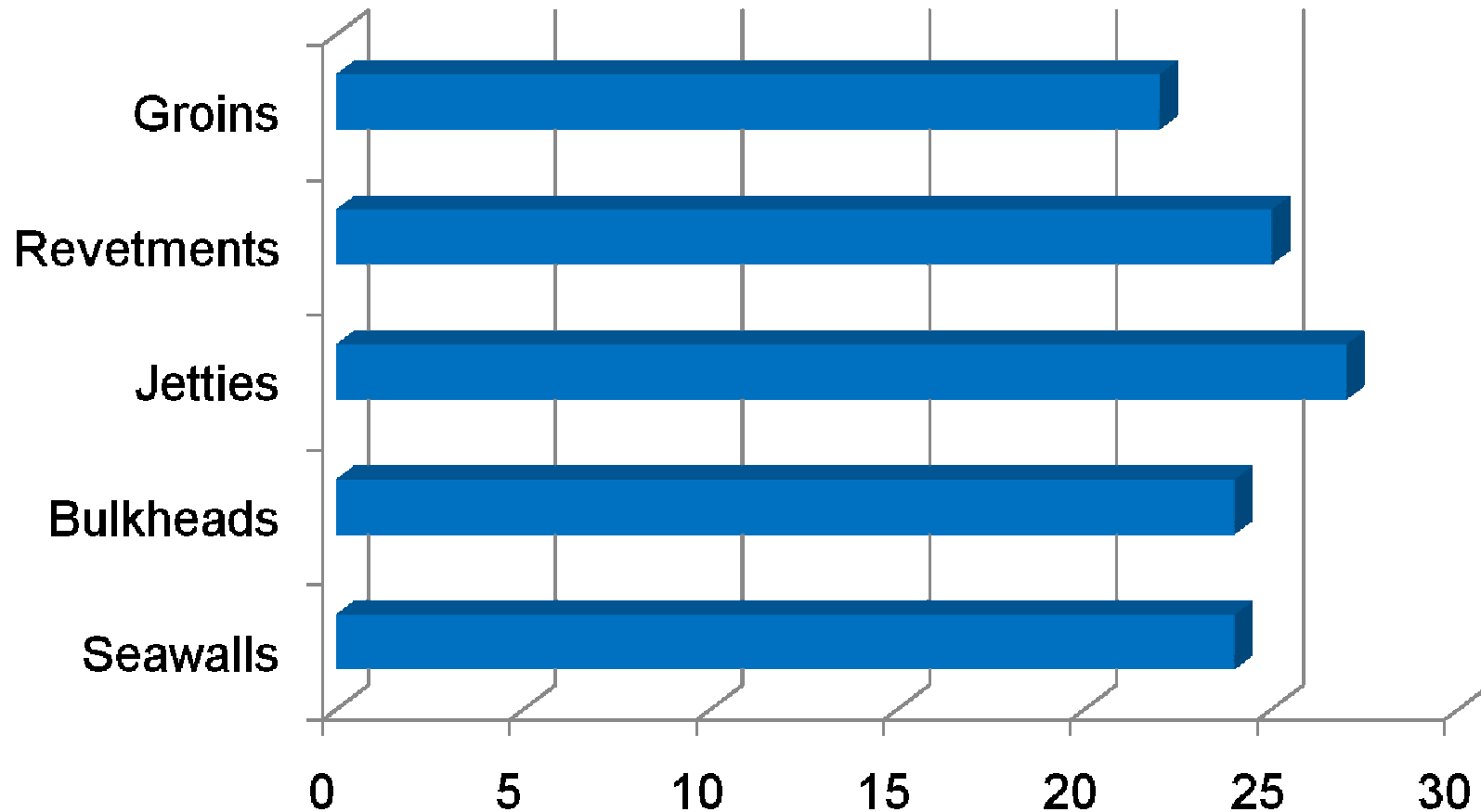
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Hard Stabilization Options

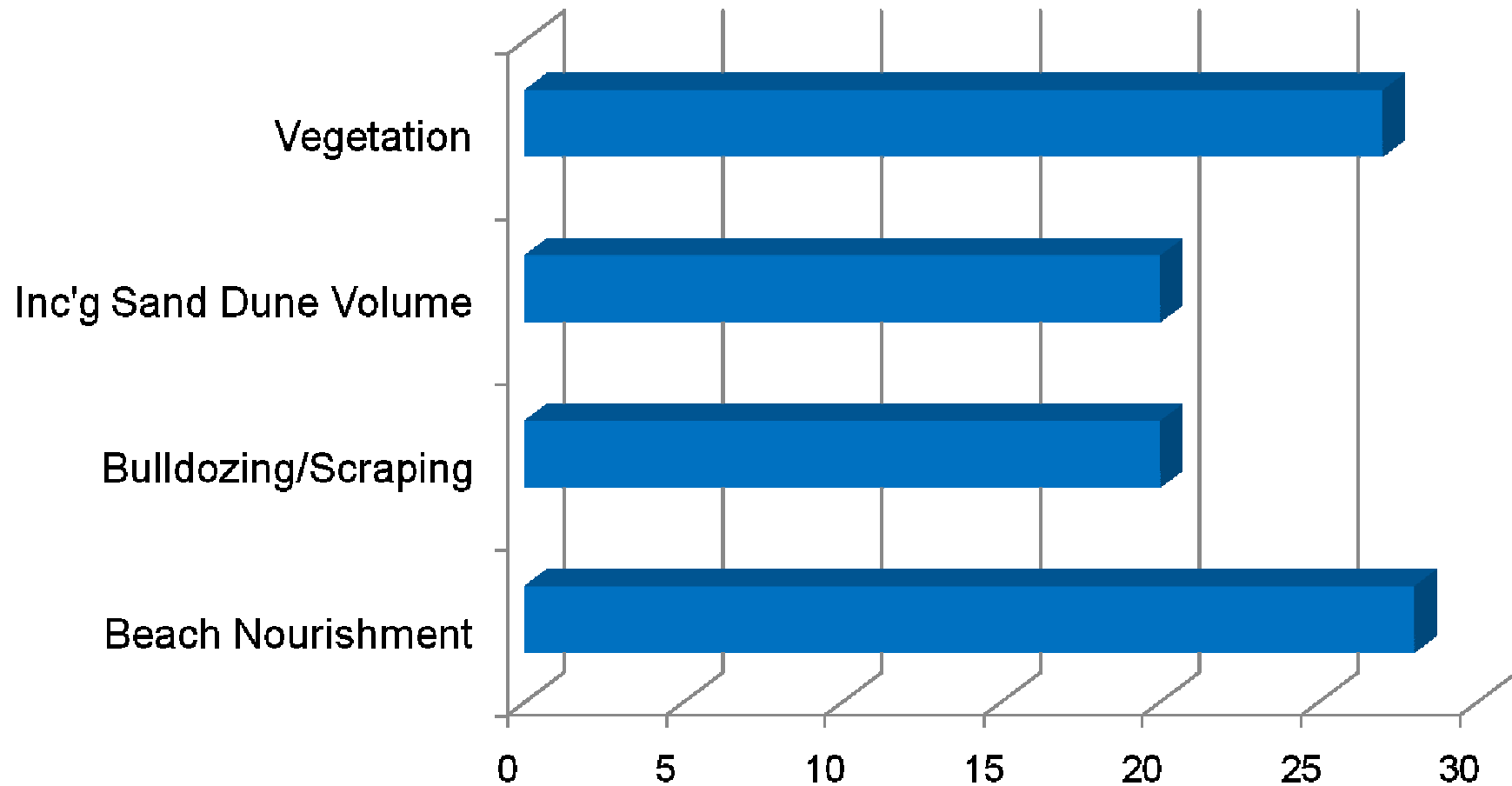
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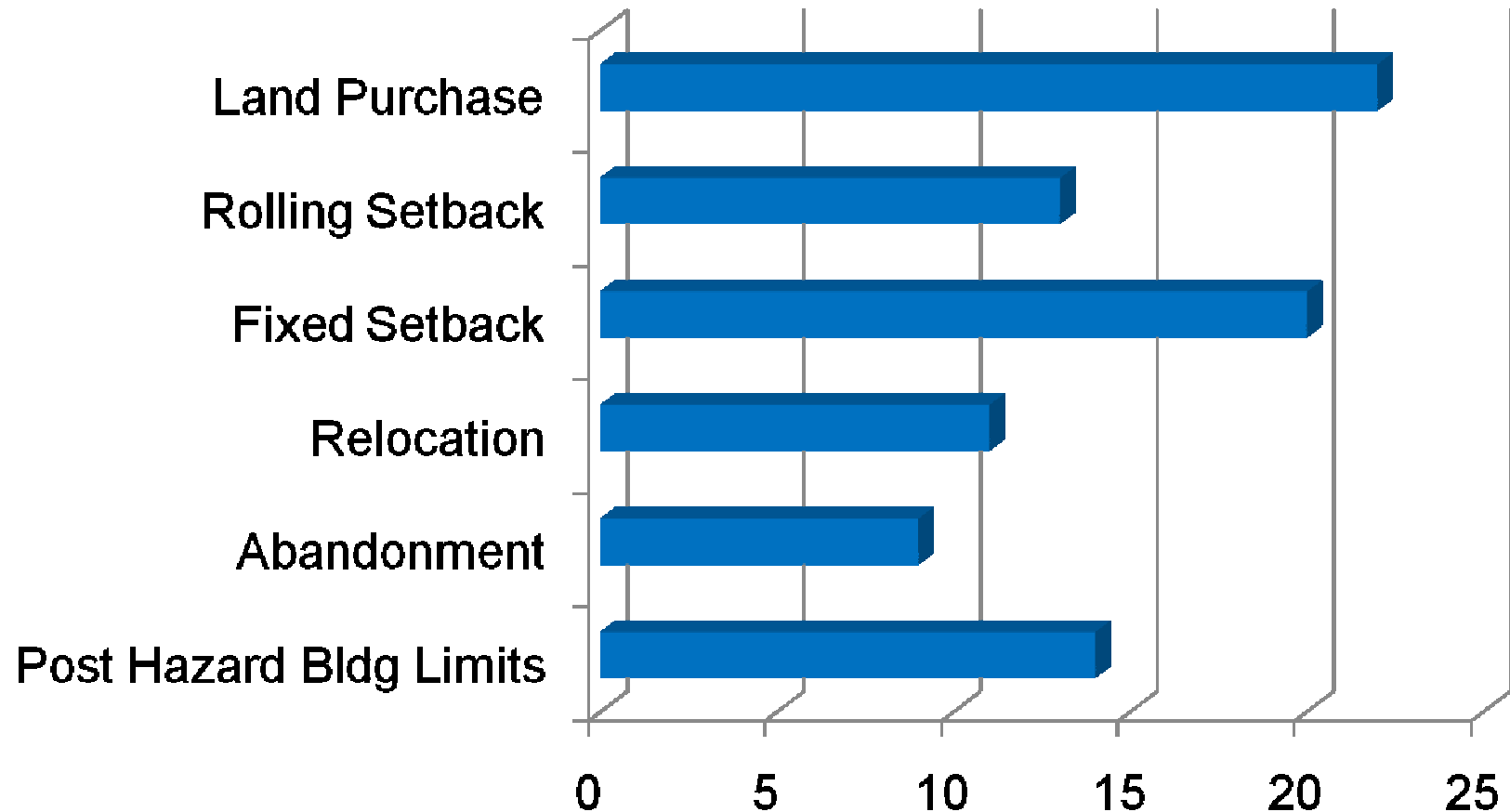
Soft Stabilization Options

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Development Modification

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Survey Instrument example

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Survey Excerpt:

1. How would you rate the effectiveness of your state's shoreline management plan in generating the anticipated shoreline protection?

1

Ineffective

2

Somewhat
ineffective

3

Neutral

4

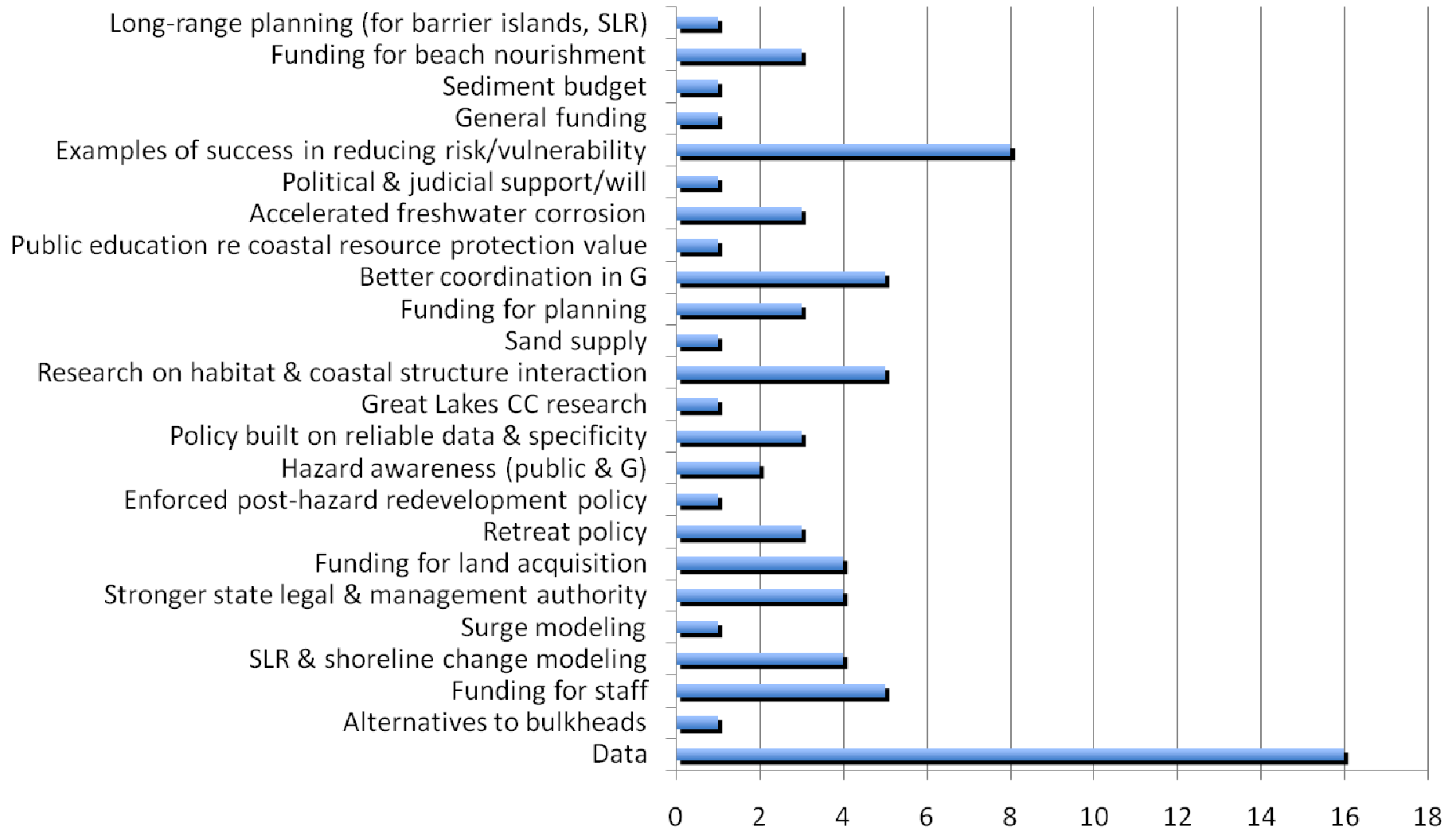
Effective

5

Very
effective

Greatest Needs Identified

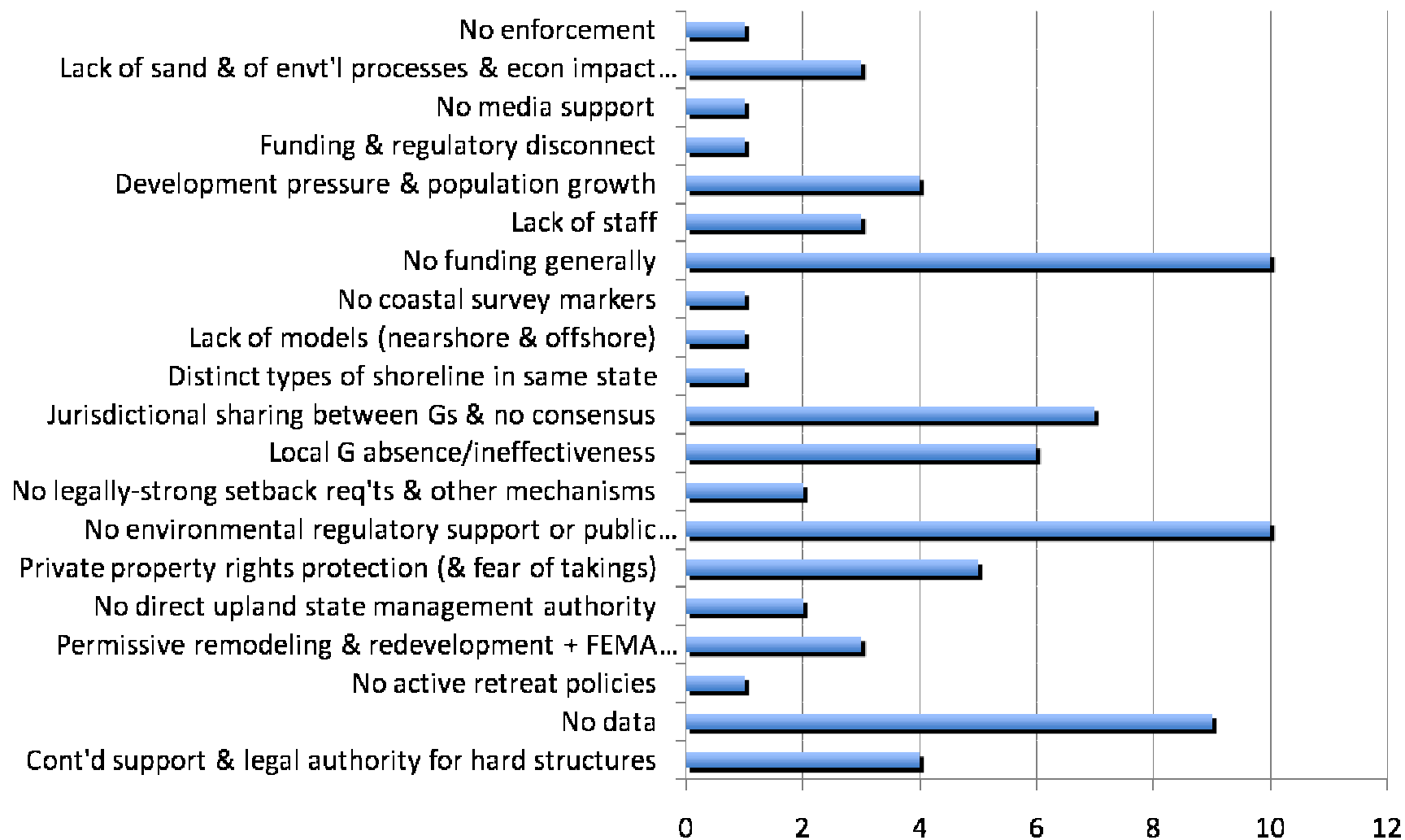
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Greatest Impediments Identified

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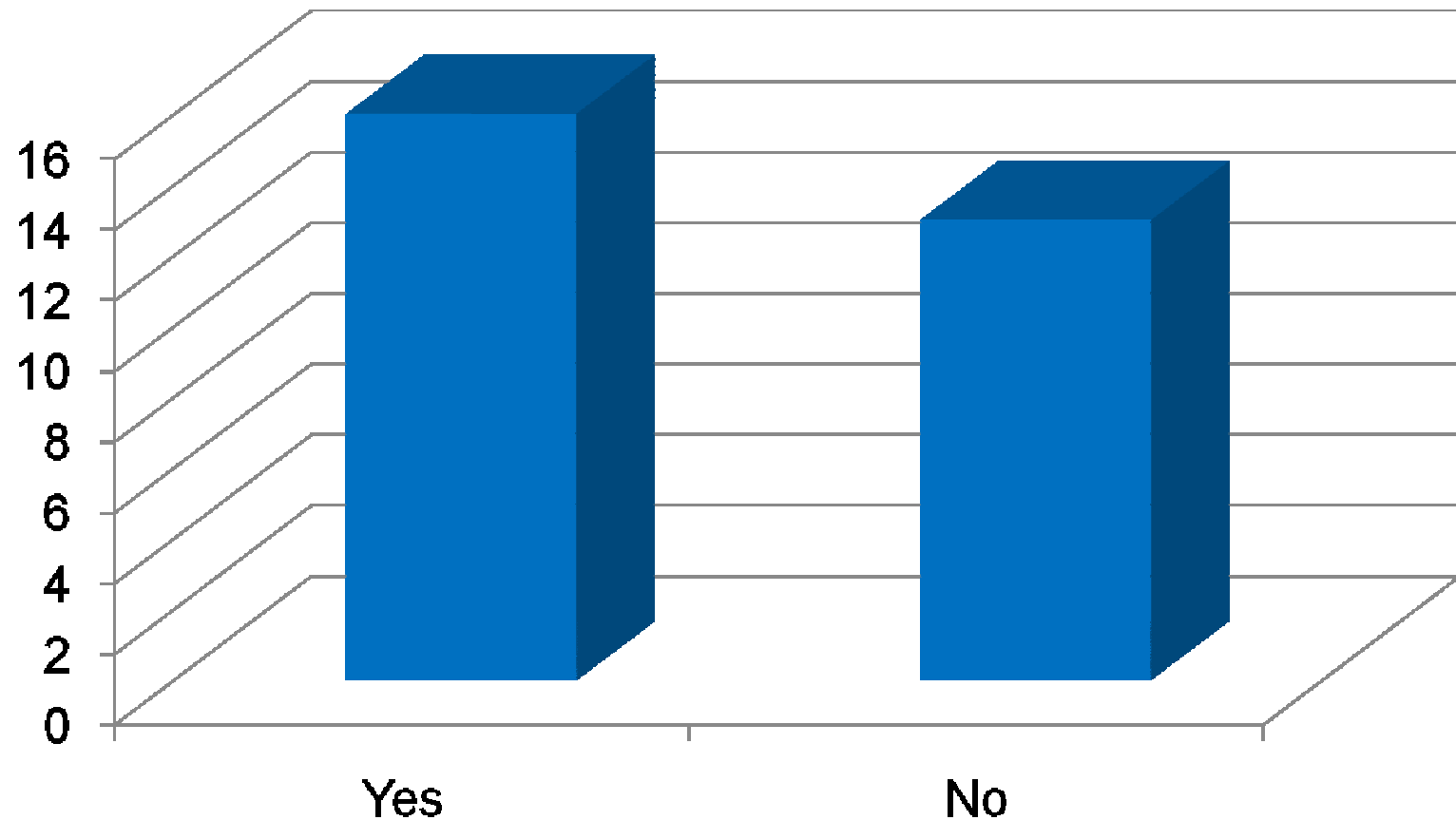
Findings: Kinds of Innovations

Most innovation fell into the category of regulatory planning or plans, including:

- ▣ real estate disclosures
- ▣ building 'dynamic revetments' aka berms
- ▣ new erosion hazard risk zones
- ▣ rolling easements (but differ in definition by state)
- ▣ structure relocation + plans with retreat zoning
 - PDRs for upland areas
- ▣ barrier island classification & critical area approach
- ▣ prohibiting new hard structures e.g. seawalls
- ▣ regional sediment management planning
- ▣ using a long-term erosion rate to determine setbacks
 - 100-year Erosion Hazard Areas and SLR impacts used to site beachfront development
- ▣ beach and inlet management plan to determine beach nourishment
- ▣ Triangulated data collection, including using personal watercraft-based beach profiling on a monthly basis
- ▣ CSC COHIS project

Sea Level Rise Included in Plan

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Analysis: Innovation Criteria

- Innovation in tools and/or management strategies. [1-2pts]
- *Accelerated* SLR incorporated into statutes, rules, regulations, or plans and/or official state action formally recognizing SLR. [1 pt]
- Relevant specificity in state statutes, rules, and regulations, including:
 - adaptive management and/or beach effect monitoring, with enforcement and shoreline change acknowledgement; [0.5 pts]
 - provision for assessment of effectiveness of own program; [0.5 pts]
 - frequency of substantive statutory and/or code amendment, particularly after year 2000; [0.5 pts]
- Physical plan to manage all coastal areas of the state, in place and available to the public. [1 pt]
- Communication of shoreline management strategies readily available to the public via state coastal program website, including enumerating the land use planning and permitting process, identifying the lead agency, and links to statutes, rules and regulations, plans, and publications. [1 pt]

Identification of Innovative States

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- ▣ Hawaii (5)
- ▣ Maine (6)
- ▣ Maryland (5)
- ▣ New York (4.5)
- ▣ Oregon (4.5)
- ▣ Rhode Island (6.5)
- ▣ Texas (5)



Edisto Beach State Park: www.coastalcleanup.org

Findings: Emerging Trends

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- Tool Choice
 - ▣ Soft stabilization most popular type of shoreline management tool
 - Beach nourishment
 - Vegetation
 - ▣ Modification of development utilized the least
 - Setbacks not as popular as perceived
- Few, if any plans
 - ▣ Only RI, SC, and TX have overarching shoreline management plans
 - ▣ To most states, “program” = “plan” (meaning a combination of statutes, rules and regulations/admin codes, and local plans—where available)



Phase 2

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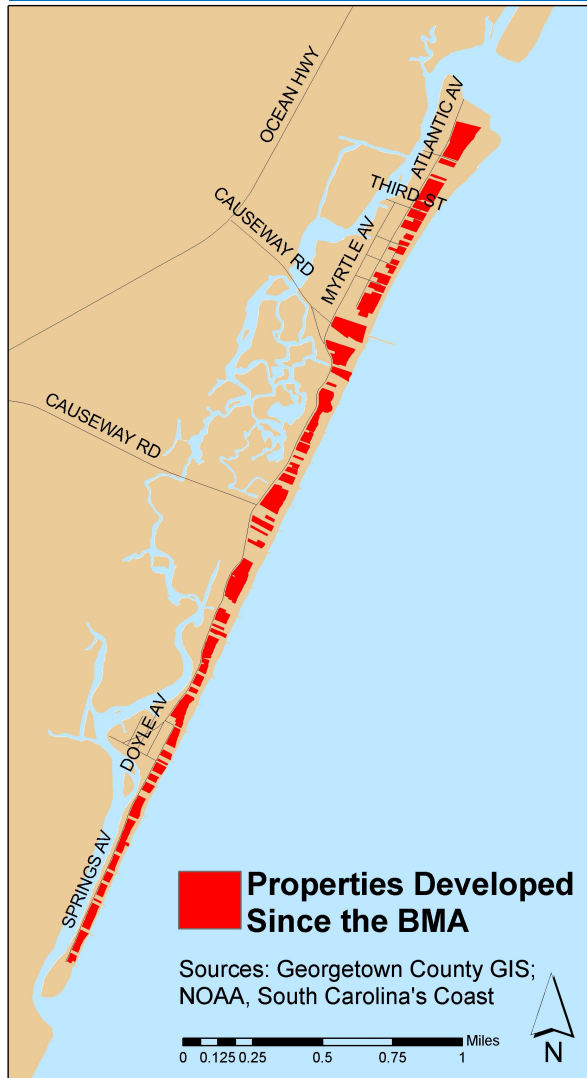
Development Trends

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Case Studies	Beachfront Structures Built Since BMA					
	Total Structures	Total Structures Built Since BMA		Beachfront Structures	Structures Built Since BMA	
Pawleys Island	486	412	84.8%	232	212	91.4%
Hilton Head	18,635	7,891	42.3%	615	233	37.9%

Development Trends: Pawleys Island

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- Over 90 percent of shoreline properties have been developed or redeveloped since the BMA-
- That's 51 percent of all development on Pawleys Island has occurred since the BMA.
- 55 permanent structures intersect or lie seaward of the setback line.
- Of these, 50 were built after the BMA.

Pawleys Island Example

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Development Since the Beachfront Management Act

- Structures Built Since BMA
- Building Footprints
- 1984 Shoreline
- 2000 Shoreline
- 2006 Shoreline
- Setback
- Baseline

Sources: Georgetown County GIS;
NOAA, South Carolina's Coast

0 25 50 100 150 200 Feet



Development Trends: Hilton Head

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






- 265 permanent structures intersect or lie seaward of the setback line.
- Of these, 124 were built after the BMA.
- 2 structures partially lie seaward of the baseline.
- Beach renourishment efforts have extended the width of the beach over time, allowing beachfront properties to remain compliant with the state's baseline and setback.

Hilton Head Example

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Development Since the Beachfront Management Act

-  Structures Built Since BMA
-  Building Footprints
-  1987 Shoreline
-  2000 Shoreline
-  2006 Shoreline
-  Setback
-  Baseline

Sources: Georgetown County GIS; Hilton Head GIS; NOAA, South Carolina's Coast; SCDHEC-OCRM

0 25 50 100 150 200 Feet



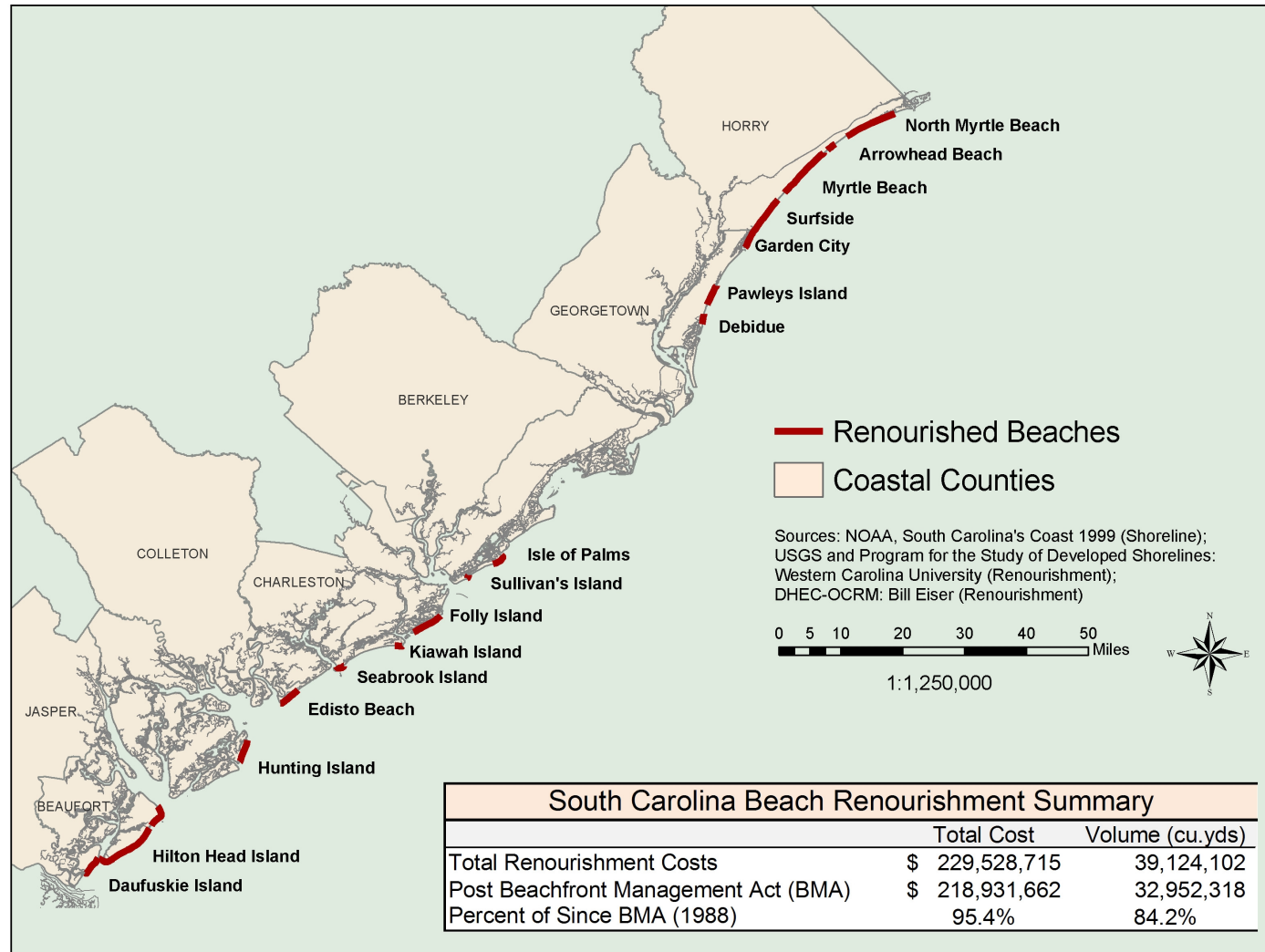
Beach Renourishment Costs

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South Carolina Beach Renourishment Estimates		
Beach	Total Cost	Volume (cu.yds)
Daufuskie	\$ 6,000,000	1,400,000
Debidue	\$ 8,100,000	1,041,693
Edisto Beach	\$ 9,450,000	1,880,000
Folly Beach	\$ 35,950,000	5,928,560
Grand Strand	\$ 94,771,250	11,240,700
Hilton Head	\$ 40,900,000	8,621,000
Hunting Island	\$ 13,978,553	5,082,149
Huntington Beach	\$ 900,000	450,000
Isle of Palms	\$ 10,875,000	450,000
Kiawah Island	\$ 3,600,000	550,000
Pawleys Island	\$ 2,338,912	530,000
Seabrook Island	\$ 2,460,000	1,915,000
Sullivans Island	\$ 230,000	35,000
Totals	\$ 229,553,715	39,124,102

Beach Renourishment Projects

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Questions?

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Findings: Takings

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- Several state managers mentioned the need for judicial action—in the states’ favor—on relatively novel retreat policy e.g.:
 - ▣ Rhode Island has a post-hazard event re-building prohibition, with “structures sometimes teetering on the edge” and one of the biggest issues to them is “getting courts to support coastal management even where they see property owners’ obvious plight.”
 - ▣ RI & GA institute residential restrictions on undeveloped and moderately developed barrier islands, refusing to allow utility or service extension.
 - ▣ RI is currently defending takings cases (plural) in court over this policy, as are other innovative states (e.g. TX).
 - ▣ South Carolina, whose beachfront management is famous for the seminal U.S.S.C. holding *Lucas v. South Carolina Coastal Commission* takings case, expressed a “need to be sued for a takings claim on the redevelopment of seawalls after an event—just to show judicial support of the policy. We not to allow people to armor, and we need to win.”